D0 Alarms

Local Station Implementation

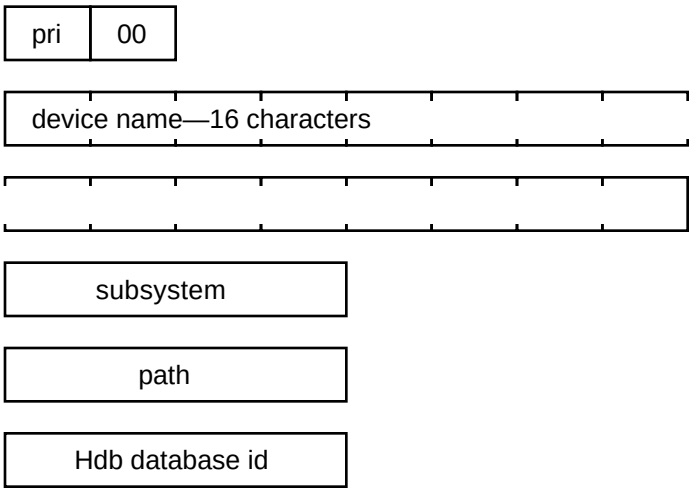
Feb 5, 1990

New alarm message protocols are required for use by D0 in order to conform with the "D0 CDAQ Network Data Transmission Protocol" document by Alan Jonckheere. Alarms messages are assumed to use Acnet header-style messages designed by Charlie Briegel on the token ring network. This document describes the implementation of D0 alarms in the Local Station software.

Device Information Blocks

Alarm parameters must be downloaded from the D0 Host to assist the Local Station in building the alarm messages that are required. This allows the Host alarm processing to avoid accesses to its own Rdb database as much as possible in the interest of execution efficiency.

There are three types of alarm messages—analog, binary and comment. For each there is a Device Information Block that must be downloaded in the following format:



Three new system tables are used to contain these parameters for the three types of alarms. The tables numbered #21, #22 and #23 are named `AADIB`, `BADIB` and `CADIB`, for Analog Alarm Device Information Block, Binary Alarm DIB, and Comment Alarm DIB. Each is allocated 32 bytes / entry to include the 30 bytes above *preceded* by a word used to keep a date-of-last-change for that table entry. (By preceding the DIB with this word rather than following it, the name is kept quad-aligned in order to optimize memory access for name searches.) The number of entries for each table is the same as the number of analog Channels, the number of binary Bits, and the number of Comments, respectively. New listypes support access to these tables both for downloading and for reading access.

parameters such as nominal and tolerance values are set. In this case, there already exists an equivalent data structure in the current system. To support a faç ade of the new structures, additional read and set type routines are used. These routines allow access to the different structures used internally through an interface that D0 specified. If the underlying internal structures change in the future, then these routines can be modified as needed without requiring changes at the Host level. (This approach might be compared to the "methods" used in object-oriented languages.)

Local alarms display

To support display of local alarm messages, the Alarms Task passes the current alarm message with the "used" bit set through OUTPQ for later processing by QMonitor *in addition* to the D0-specific alarm message that is queued to the network. When the Alarms Task receives a message from another station (source lan-node not equal to its own) directed to the task named ALRM, it allocates a memory block to contain the alarm message but builds it in the *classic* form. In this way, the classic support for alarm message encoding into ascii (for display on the bottom line of the local console or via the local serial port) still works.

Comment alarm data

A new system table #10 named CDATA provides space for data associated with comment alarms. This data includes a comment alarm flags word, an alarm count, and the text to be used with the comment alarm message.

LTT (Listype Table) changes

listype# offset	ident purpose	read#	set#	#bytes	tbl#	
56	16	1	1	2	10	0 CDATA access
57	1	16	18	10	0	0 D0 Analog alarm ctrl
58	2	17	19	2	2	0 D0 Binary alarm ctrl
59	16	18	20	32	10	0 D0 Comment alarm ctrl
60	17	0	21	2	0	0 General resets
61	1	1	1	30	21	2 AADIB access
62	1	1	1	16	21	4 Analog name
63	1	1	0	0	21	0 AADIB date of last change
64	2	1	1	30	22	2 BADIB access
65	2	1	1	16	22	4 Binary name
66	2	1	0	0	22	0 BADIB date of last change
67	16	1	1	30	23	2 CADIB access
68	16	1	1	16	23	4 Comment name
69	16	1	0	0	23	0 CADIB date of last change

Ident type#s

- 16 Comment index
- 17 General reset index

Read type#s

- 16 Analog alarm flags, nominal, tolerance
- 17 Binary alarm flags
- 18 Comment alarm flags

Set type#s

- 18 Analog alarm flags, nominal, tolerance
- 19 Binary alarm flags
- 20 Comment alarm flags
- 21 General resets

New table#s

- 10 CDATA Comment Data Table
- 21 AADIB Analog DIB
- 22 BADIB Binary DIB
- 23 CADIB Comment DIB